



## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

**“जानने का अधिकार, जीने का अधिकार”**

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

**“पुराने को छोड़ नये के तरफ”**

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 7959 (1987): Polyethylene Containers for Foam Compounds  
[PCD 21: Plastics Containers]

**“ज्ञान से एक नये भारत का निर्माण”**

Satyanaaranay Gangaram Pitroda

Invent a New India Using Knowledge



**“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”**

Bhartṛhari—Nītiśatakam

“Knowledge is such a treasure which cannot be stolen”





BLANK PAGE



PROTECTED BY COPYRIGHT

IS : 7959 - 1987

*Indian Standard*  
SPECIFICATION FOR  
POLYETHYLENE CONTAINERS FOR  
FOAM COMPOUNDS  
*(First Revision)*

UDC 621.798.1 [ 678.742.2 ] : 661.185.7

© Copyright 1987

BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

*Indian Standard*

**SPECIFICATION FOR  
POLYETHYLENE CONTAINERS FOR  
FOAM COMPOUNDS**

**( First Revision )**

---

Plastics Containers Sectional Committee, MCPD 11

*Chairman*

SHRI A. S. ATHALYE

*Representing*

Technology Transfer, Bombay

*Members*

SHRI C. D. ANAND

Directorate General of Technical Development,  
New Delhi

SHRI M. BALAN

All India Food Preservers' Association ( Regd ),  
New Delhi

SHRI S. VASUDEVAN (*Alternate*)

DR I. S. BHARDWAJ

Central Institute of Plastics Engineering & Tools,  
Madras

DR K. RAMAMURTHY (*Alternate*)

DR B. P. CHANDRASEKHAR

Pesticides Association of India, New Delhi

SHRI P. A. DANDEKAR

Union Carbide India Limited, Calcutta

SHRI V. SHANKAR (*Alternate*)

SHRI V. DORAIRAJ

Polyolefins Industries Ltd, Thane

SHRI R. G. PINGE (*Alternate*)

SHRI R. N. GANJOO

BASF India Ltd, Bombay

SHRI B. JOSHI (*Alternate*)

SHRI S. S. JHAVERI

Polychem Limited, Bombay

SHRI K. G. ZAVERI (*Alternate*)

SHRI A. H. KHAN

Bright Brothers Limited, Bombay

SHRI I. G. ADVANI (*Alternate*)

DR S. LAKSHMANAN

Metal Box India Limited, Calcutta

SHRI O. BANERJEE (*Alternate*)

SHRI B. C. MEHTA

Commissioner of Food & Drug Administration,  
Bombay

SHRI V. C. SANE (*Alternate*)

SHRI V. S. MUNGE

Gujarat State Fertilizers Co Ltd, Dist Vadodara

SHRI P. V. NARAYANAN

Indian Institute of Packaging, Bombay

SHRI H. R. IYER (*Alternate*)

SHRI M. PARTHASARATHY

Polyene Film Industries Pvt Ltd, Madras

SHRI A. K. MUKHERJEE (*Alternate*)

( *Continued on page 2* )

© Copyright 1987

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act ( XIV of 1957 )* and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

( Continued from page 1 )

*Members*

**SECRETARY**

SHRIMATI DEBI MUKHERJEE ( <i>Alternate</i> )	Central Committee for Food Standards ( DGHS ), New Delhi
SHRI M. B. SINGH	Ministry of Defence ( R & D ), New Delhi
SHRI ANIL AGGARWAL ( <i>Alternate</i> )	National Organic Chemical Industries Ltd, Bombay
SHRI J. K. VADODARIA	
SHRI O. ATHAIDE ( <i>Alternate</i> )	Central Food Technological Research Institute, Mysore
SHRI P. VEERRAJU	
SHRI N. BALASUBRAMANYAN ( <i>Alternate</i> )	Warden & Co ( India ) Pvt Ltd, Bombay
SHRI E. R. VICCAJEE	
SHRI F. M. DIAS ( <i>Alternate</i> )	Director General, BIS ( <i>Ex-officio Member</i> )
SHRI B. L. RAINA, Director ( MCPD )	

*Representing*

SHRI A. R. GULATI	<i>Secretary</i>
Joint Director ( MCPD ), BIS	

Plastic Containers ( 5 Litres and Above ) Subcommittee, MCPD 11:2

*Convener*

**SHRI A. S. ATHALYE**

Technology Transfer, Bombay

*Members*

SHRI N. C. BOSE	Ministry of Defence ( DGI ), Kanpur
SHRI S. K. ATHAWALE ( <i>Alternate</i> )	
SHRI C. P. CHANDRASEKHARAN	Ministry of Railways
SHRI V. DORAI RAJ	Polyolefins Industries Ltd, Bombay
SHRI R. G. PINGE ( <i>Alternate</i> )	
SHRI H. D. KHARKAR	Bharat Petroleum Corporation Ltd, Bombay
SHRI P. V. NARAYANAN	Indian Institute of Packaging, Bombay
SHRI H. R. IYER ( <i>Alternate</i> )	
SHRI M. PARTHASARATHY	Polyene Film Industries Ltd, Madras
SHRI A. K. MUKHERJEE ( <i>Alternate</i> )	
SHRI S. V. PHADKE	Sinter Plast Containers, Kalol
SHRI NARAYANSWAMY ( <i>Alternate</i> )	
SHRI P. S. PILLAI	Helipastics Limited, Bombay
SHRI S. SUNDARAM ( <i>Alternate</i> )	
SHRI M. B. RAMGADIA	Indian Oil Corporation Ltd, Bombay
SHRI K. S. MENON ( <i>Alternate</i> )	
SHRI V. SHANKAR	Union Carbide India Ltd, Bombay
SHRI E. R. VICCAJEE	Warden & Co ( India ) Pvt Ltd, Bombay
SHRI F. M. DIAS ( <i>Alternate</i> )	

*Indian Standard*

SPECIFICATION FOR  
POLYETHYLENE CONTAINERS FOR  
FOAM COMPOUNDS

( *First Revision* )

**0. FOREWORD**

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 30 January 1987, after the draft finalized by the Plastics Containers Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

**0.2** This standard was first published in 1976 and was covering 20 litre HDPE jerrycans only. With the revision of the foam compound specification IS : 4989 in two parts, covering the protein foam in IS : 4989 ( Part 1 )-1985\* and the aqueous film forming foam ( AFFF ) in IS : 4989 ( Part 2 )-1984†, this standard has also been revised to take into account the packaging requirements of both the types of foam compounds. Whereas 20 and 30 litre jerrycans are intended for use with the mechanical foam generating equipment for extinguishing fire in flammable liquids, the containers of higher capacity of 50, 80, 100 and 200 litres which are used for storage and transportation of the material have also been covered in this revision.

**0.2.1** Besides the additional capacities covered in this revision, the material and testing clauses have been thoroughly revised. Performance tests like drop test ( **10.1.3** ), stack load test ( **10.2.2** ) and handle test ( **10.2.1** ) have been thoroughly revised to subject the containers to the simulating handling and storage conditions as in actual use. Hydrostatic test pressure ( **10.1.2** ) and stack load test ( **10.2.2** ) have been added new, whereas permeability test, chemical resistance test, neck cracking test, test for penetration resistance have been deleted. In **6.1**, recommended mass of the containers is given for the guidance of the manufacturer and should not be taken as a criterion for acceptance of the containing when it passes the test requirements given under **10.1.3** and **10.2.2**.

---

\*Specification for foam concentrate ( compound ) for producing mechanical foam for fire fighting: Part 1 Protein foam ( *second revision* ).

†Specification for foam concentrate ( compound ) for producing mechanical foam for fire fighting: Part 2 Aqueous film forming foam ( AFFF ).

**0.3** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

## 1. SCOPE

**1.1** This standard prescribes the requirements for polyethylene containers intended for packing foam compounds covered in IS : 4989 ( Part 1 )-1985†, IS : 4989 ( Part 2 )-1984‡ and IS : 4989 ( Part 3 )-1987§.

## 2. TERMINOLOGY

**2.1** For the purpose of this standard, the terms covered under **2** of IS : 7408 ( Part 2 )-1984|| shall apply.

## 3. SHAPE

**3.1** The container shall be rectangular or cylindrical in shape and shall be stackable vertically without any external support.

## 4. CAPACITY

**4.1** The nominal capacities of the containers shall be 20, 30, 50, 80, 100 and 200 litres. The minimum brimful capacity of the container shall be not less than its nominal capacity plus 5 percent.

## 5. MATERIAL

**5.1 Container** — The container shall be manufactured from High Density Polyethylene conforming in density and melt-flow index MFI ( $i_5$ ) to Grade 42 BB or 42 BA of IS : 7328-1974¶. The melt-flow index MFI ( $i_5$ ) shall not exceed 0·6 g/10 minutes.

**5.2 Cap** — The cap shall be made from injection moulding or extrusion grade HDPE.

**5.3 Inner Plug** — The inner plug where provided shall be made from moulding grade LDPE or HDPE.

---

\*Rules for rounding off numerical values ( revised ).

†Specification for foam concentrate ( compound ) for producing mechanical foam for fire fighting: Part 1 Protein foam( second revision ).

‡Specification for foam concentrate ( compound ) for producing mechanical foam for fire fighting: Part 2 Aqueous film forming foam ( AFFF ).

§Specification for foam concentrate ( compound ) for producing mechanical foam for fire fighting: Part 3 Fluoro-protein foam.

||Specification for blown moulded polyolefin containers: Part 2 Over 5 litres up to 30 litres capacity.

¶Specification for high density polyethylene materials for moulding and extrusion.

## 6. MASS

**6.1** Recommended mass of the container with cap and insert is as under:

<i>Capacity</i>	<i>Min Mass</i>
litres	kg
20	1.2
30	1.75
50	2.75
80	4.5
100	5.0
200	9.0

## 7. FILLING ORIFICE

**7.1** The containers up to and including 80 litre capacity shall be provided with one principle orifice of minimum internal diameter of 45 mm. The containers of 100 and 200 litre capacities shall be provided with one small orifice of 20 mm minimum dia as vent mouth besides the principle orifice. Each orifice shall be closed with an insert fitting snugly into it and a screw cap, screwed tight on it so as to provide a leakproof closure.

## 8. HANDLE

**8.1** The container shall be provided with suitable handle(s) or grips. The design of handles or grips shall be such that it shall provide a balance while lifting the filled container and shall not interfere with the stacking of the containers.

## 9. CONSTRUCTION

**9.1** The containers shall be of one piece construction. The handle(s) shall be moulded as integral parts for container up to 50 litre capacity. Containers of higher capacities may be provided with two or more handles or grips fixed symmetrically but may or may not be moulded integrally with the container.

## 10. TEST

### 10.1 Routine Tests

**10.1.1 Closure Leakage Test** — When tested by the method given in Appendix A, there shall be no evidence of leakage.

**10.1.2 Hydrostatic Pressure Test** — When tested by the method described in Appendix B, the containers shall not show any sign of leakage or rupture.

**10.1.3 Drop Test** — When tested at ambient temperature by the method given in Appendix C, the containers shall not rupture or show any leakage.

## **10.2 Type Tests**

**10.2.1 Handle Strength Test** — The container filled with water at ambient temperature to its nominal capacity, when suspended free from its handle(s)/grips for one hour shall not break or show any sign or damage to the container.

**10.2.2 Stack Load Test** — The containers when tested by the method described in Appendix D, shall show no leakage from the container nor any deformation so as to cause instability in stacking.

## **11. SAMPLING**

**11.1** The samples of the containers shall be drawn and the criteria for conformity shall be determined as prescribed in Appendix E.

## **12. MARKING**

**12.1** Each container shall be marked with the following information:

- a) Name or trade mark of the manufacturer, and
- b) Nominal capacity of the container.

**12.1.1** The container complying with the requirements of this standard may also be marked with the Standard Mark.

**NOTE** — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

**A P P E N D I X A***( Clause 10.1.1 )***METHOD OF TEST FOR CLOSURE LEAKAGE****A-1. PROCEDURE**

**A-1.1** The container shall be filled to its nominal capacity with water at ambient temperature and then closed tightly with the insert and outer cap.

The container shall then be allowed to stand with its upside down with closure at the lowest point without any external support at the closure for one hour and examined for leakage through or around the closure.

**A P P E N D I X B***( Clause 10.1.2 )***METHOD OF TEST FOR HYDROSTATIC PRESSURE TEST****B-1. APPARATUS**

- a) A water supply at ambient temperature connected to a tapered rubber plug which will seal the mouth of the container. A suitably modified screw cap may be used instead of the rubber plug.
- b) A means of regulating the water pressure and a pressure gauge of range 0 to 150 kPa and of accuracy  $\pm 2$  percent.

**B-2. PROCEDURE**

**B-2.1** The container shall be filled with water to exclude all air and then connected to the water supply. The pressure shall be increased to 100 kPa ( 1 kg/cm<sup>2</sup> ) and held for a period of 5 minutes.

Any leakage from the container other than from around the mouth, or localized bulging of the container shall be deemed to indicate failure to meet the test requirements.

## A P P E N D I X C

( Clause 10.1.3 )

### METHOD OF TEST FOR DROP TEST

#### C-1. TEST CONTAINERS

**C-1.1** Three containers shall be used for each test. In case of containers with handles projecting outside, an extra container shall be taken for drop directly on to the handles.

#### C-2. PROCEDURE

**C-2.1** All the containers shall be filled to their nominal capacity with water at ambient temperature. Each container shall be closed with the inner plug and the cap screwed tight and prepared as for transport.

**C-2.2** Each container shall be subjected to one drop on a rigid, level dropping surface that absorbs negligible energy, from a height of 1.2 m measured from the lowest point of the container.

An untested container shall be used for each drop, and the point of impact shall be as follows:

- a) Drop the first container flat on the bottom side.
- b) Drop the second container flat on the top side directly on to the closure.
- c) Drop the third container on the side; in case of rectangular containers drop on the narrower side.
- d) In case of projecting handles, drop the fourth container directly on each handle.

## A P P E N D I X D

( Clause 10.2.2 )

### METHOD FOR STACKING TEST

**D-1.** Containers shall be filled with water to its nominal capacity at ambient temperature and closed tight as in usual manner. The containers shall be stacked on a horizontal plane surface without any outside support to a height as given below or otherwise a single container may be subjected to a vertical top load equivalent to the stacking load of container about it:

- a) Stack 4 high in case of 20 and 30 litre containers,

- b) Stack 3 high in case of 50 and 80 litre containers, and
- c) Stack 2 high in case of 100 and 200 litre containers.

The stacking period shall be 21 days.

**D-2.** The bottom most container shall be examined for any leakage, bulging or deformation at the end of 21 days after removing the stack load. Any leakage or permanent deformation likely to reduce its strength or cause instability in stacking shall indicate failure of the container in this test.

## A P P E N D I X E

( Clause 11.1 )

### SAMPLING OF CONTAINERS FOR FOAM COMPOUND

#### E-1. SCALE OF SAMPLING

**E-1.1 Lot** — In any consignment all the containers of the same material and drawn from a single batch of manufacture shall be grouped together to constitute a lot.

**E-1.2** For ascertaining the conformity to the requirements of this specification, tests shall be carried out separately for each lot. The number of containers to be sampled from a lot for ascertaining conformity to the requirements of this specification shall be in accordance with Table 1.

**TABLE 1 SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES**

LOT SIZE (N)	FOR NON-DESTRUCTIVE TESTS	
	No. of Containers to be Selected (n)	Permissible Number of Defectives (3)
(1)	(2)	(3)
Up to 500	10	2
501 to 1 000	20	4
1 001 and above	30	6

**E-1.3** The containers shall be selected at random from the lot. To ensure the randomness of selection, method given in IS : 4905-1968\* may be followed.

\*Methods for random sampling.

**E-2. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY**

**E-2.1** For non-destructive tests the containers selected at random according to **E-1.2** shall be tested for capacity, closure leakage test (**10.1.1**), and hydrostatic pressure test (**10.1.2**). A container failing to satisfy any one or more of these tests requirements shall be regarded as defective. The lot shall be considered as conforming to the requirements for these characteristics, if the number of defectives in the sample does not exceed the number given in col 3 of Table 1.

# BUREAU OF INDIAN STANDARDS

## *Headquarters:*

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 331 0131 331 1375

Telegrams : Manaksantha  
( Common to all Offices )

## *Regional Offices:*

*Telephone*

\*Western : Manakalaya, E9 MIDC, Marol Andheri ( East )      6 32 92 95  
BOMBAY 400093

†Eastern : 1/14 C. I. T. Scheme VII M. V. I. P. Road,      36 24 99  
Maniktola, CALCUTTA 700054

Northern : SCO 445-446, Sector 35-C      { 2 18 43  
CHANDIGARH 160036      { 3 16 41

Southern : C. I. T. Campus, MADRAS 600113      { 41 24 42  
{ 41 25 19  
{ 41 29 16

## *Branch Offices:*

'Pushpak', Nurmohamed Shaikh Marg, Khanpur      { 2 63 48  
AHMADABAD 380001      { 2 63 49

F Block, Unity Bldg, Narasimharaja Square,      22 48 05  
BANGALORE 560002

Gangotri Complex, 5th Floor, Bhadbhada Road,      6 67 16  
T. T. Nagar, BHOPAL 462003

Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002      5 36 27

53/5 Ward No. 29, R. G. Barua Road, 5th Byelane,      —  
GUWAHATI 781003

5-8-56C L.N. Gupta Marg, HYDERABAD 500001      22 10 83

R14 Yudhister Marg, C Scheme, JAIPUR 302005      { 6 34 71  
{ 6 98 32

117/418 B Sarvodaya Nagar, KANPUR 208005      { 21 68 70  
{ 21 82 92

Patliputra Industrial Estate, PATNA 800013      6 23 05

Hantex Bldg (2nd Floor), Rly Station Road,      52 27  
TRIVANDRUM 695001

*Inspection Office (With Sale Point):*

Institution of Engineers (India) Building, 1332 Shivaji Nagar,      5 24 35  
PUNE 411005

\*Sales Office in Bombay is at Novelty Chambers, Grant Road,      89 65 28  
BOMBAY 400007

†Sales Office in Calcutta is at 5 Chowringhee Approach,      27 68 00  
P.O. Princep Street, CALCUTTA 700072

**AMENDMENT NO. 1 JUNE 2003**  
**TO**  
**IS 7959 : 1987 SPECIFICATION FOR POLYETHYLENE**  
**CONTAINERS FOR FOAM COMPOUNDS**

**( First Revision )**

( *Page 3, Foreword, clause 0.2.1* ) — Insert the following new clause after 0.2.1 and renumber the subsequent clause:

‘0.3 A scheme of labelling environment friendly products with the ECO logo has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark is being administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolutions No. 71 dated 21 February 1991 and No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO logo, it shall also carry the ISI Mark of the BIS besides meeting additional environment friendly requirements. For this purpose the Standard Mark would be a single mark being a combination of the ISI Mark and the ECO logo.

This amendment is based on the gazette Notification No. 170 dated 18 May 1996 for plastic products as environment friendly products published in the Gazette of the Government of India. This amendment is, therefore, being issued to this standard to include environment friendly requirements for Polyethylene containers for foam compounds.’

( *Page 6, clause 10.2.2* ) — Insert the following new clauses after 10.2.2 and renumber the subsequent clauses:

## **‘11 ADDITIONAL REQUIREMENTS FOR ECO-MARK**

### **11.1 General Requirements**

**11.1.1** The product shall conform to the requirements for quality, safety and performance prescribed.

**11.1.2** The manufacturer shall produce to BIS the consent clearance as per the provisions of *Water (Prevention & Control of Pollution) Act, 1974* and *Air (Prevention & Control of Pollution) Act, 1981* along with the authorization, if required under *Environment (Protection) Act, 1986* and the Rules made thereunder while applying for the ECO-Mark. The manufacturers of plastic

wares shall produce documentary evidence with respect to the compliance of regulation under *Drugs and Cosmetic Act, 1940* and the Rules made thereunder, wherever necessary.

**11.1.3** The product must display a list of critical ingredients in descending order of quantity present expressed as percent of the total. The list of such ingredients shall be identified by Bureau of Indian Standards.

**11.1.4** The product packaging shall display in brief the criteria based on which the product has been labelled as 'Environment Friendly'.

**11.1.5** The material used for product packaging shall be recyclable or biodegradable.

**11.1.6** It shall also suitably mention that ECO-Mark label is applicable only to the packaging material/package, if content is not separately covered under ECO-Mark. It may be stated that ECO-Mark is applicable to the product or packaging material or both.

## **11.2 Product Specific Requirements**

The plastic products shall apart from fillers and reinforcing agents, be made from the minimum of 90 percent, by weight of compatible plastic wastes.

**NOTE —** The manufacturer shall provide documentary evidence by way of certificate or declaration to this effect.'

( PCD 21 )